AMENDMENT TO CLAIMS

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1. (Currently Amended) Apparatus for processing a liquid feedstock into a clean burning **combustible gas** ~~**magnegas**~~ via ~~**a submerged**~~ **an** electric arc **adapted to be submerged in a liquid feedstock** between at least one pair of electrodes with long life, minimal power losses and multiple flows substantially through said submerged electric arc, comprising:

a pressure resistant vessel;

the pressure resistant vessel ~~**being**~~ **adapted to be** essentially filled with a liquid feedstock;

at least one pair of electrodes having copper holders extending into copper rods extending from inside the pressure resistant vessel to outside said pressure resistant vessel;

said at least one pair of electrodes ~~**having a geometry which minimizes a distance between an electric arc between the electrodes and said copper holders**~~ **having means** for minimizing **a** power loss in the delivery of ~~**the**~~ **a** current to ~~**said**~~ **an** electric arc **between the electrodes**, said electrodes having remaining dimensions essentially unrestricted for maximizing their life;

means for delivering ~~**a**~~ **said** current to said at least one pair of electrodes at least sufficient to create said ~~**submerged**~~ electric arc;

motion means for acting on said copper rods for initiating, maintaining and optimizing said ~~**submerged**~~ electric arc;

means for collecting the **clean burning combustible gas** ~~**magnegas**~~ produced by the ~~**submerged**~~ electric arc;

means for automatically refilling the liquid feedstock for facilitating uninterrupted long operation; and

heat exchanger means for utilizing a heat produced by a thermochemical reaction caused by said ~~**submerged**~~ electric arc for maintaining a constant temperature.

2. (Original) The apparatus according to claim 1, wherein said liquid feedstock is crude oil.

3. (Original) The apparatus according to claim 1, wherein said liquid feedstock is an oil-base waste.

4. (Original) The apparatus according to claim 1, wherein said liquid feedstock is fresh water.

5. (Original) The apparatus according to claim 1, wherein said liquid feedstock is a water-base waste.

6. (Original) The apparatus according to claim 1, wherein said liquid feedstock is seawater.

7. (Currently Amended) The apparatus according to claim 1, wherein the current of said ~~submerged~~ electric arc is continuous.

8. (Currently Amended) The apparatus according to claim 1, wherein the current of said ~~submerged~~ electric arc is alternating.

9. (Original) The apparatus according to claim 1, wherein said electrodes are composed of graphite.

10. (Original) The apparatus according to claim 1, wherein said electrodes are composed of coal.

11. (Currently Amended) The apparatus according to claim 1, wherein one of the at least one pair of electrodes is **adapted to be** negatively charged and is composed of tungsten.

12. (Currently Amended) The apparatus according to Claim 1,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cylinder **which is adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cylinder, and

wherein another of the at least one pair of electrodes is **adapted to be** negatively charged and comprises ~~a submerged~~ **an** elongated parallelepiped of length essentially equal to a length of said positively charged electrode **and adapted to be submerged in the liquid feedstock**, a minimal width and a minimal height to achieve the same life as that of the positively charged electrode, said negatively charged electrode being housed in a copper holder with a width protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of the positively charged electrode, said negatively charged electrode being placed parallel to said positively charged electrode at a mutual distance suitable to generate ~~a submerged~~ **said** electric arc, and

further comprising:

means for axially rotating said positively charged electrode; and

means for radially moving the negatively charged electrode toward and away from said positively charged electrode.

13. (Currently Amended) The apparatus according to Claim 1,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises a ~~submerged~~ ring **adapted to be submerged in the liquid feedstock and** housed within a copper holder with an axial portion protruding for consumption, and

wherein another of the at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **adapted to be submerged in the liquid feedstock** having essentially a diameter equal to a width of said ring and a minimal length to achieve the same life as that of the positively charged electrode, said negatively charged electrode being housed in a copper holder with an axial portions protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of the positively charged electrode and having an axial alignment essentially perpendicular to a radial surface of said ring ~~so as~~ to create a gap suitable for the generation of the ~~submerged~~ electric arc, and

further comprising:

means for axially rotating said ring-shaped electrode; and

means for axially moving said rod shaped electrode toward and away from the other electrode.

14. (Currently Amended) The apparatus according to Claim 1,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cone **adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cone, and

wherein another of said at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **adapted to be submerged in the liquid feedstock** offset at an angle from an axis of said positively charged electrode ~~so as~~ to form a gap suitable for the generation of the ~~submerged~~ electric arc, said negatively charged electrode being house in a copper holder with an axial part protruding for consumption, and said copper holder of the

negatively charged electrode being placed at a minimal distance from the copper holder of said positively charged electrode, and

further comprising:

means for axially rotating said positively charged electrode; and

means for axially moving said negatively charged electrode toward and away from the conical electrode.

15. (Currently Amended) The apparatus according to Claim 1,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cylinder **adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cylinder, and

wherein another of said at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **adapted to be submerged in the liquid feedstock** having a minimal diameter and length to achieve the same life as that of the positively charged electrode, said negatively charged electrode being housed in a copper holder with an axial length protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of said positively charged electrode, and said positively and negatively charged electrodes having perpendicular axial orientations at a mutual distance suitable for the generation of the ~~submerged~~ electric arc, and

further comprising:

means for rotationally, upwardly and downwardly moving said positively charged electrode in such a way to maintain the electric arc with said negatively charged electrode; and

means for axially moving said negatively charged electrode toward and away said positively charged electrode.

16. (Currently Amended) The apparatus according to Claim 1,

wherein said at least one pair of electrodes comprises ~~submerged,~~ elongated and hollow cylinders of essentially equal lengths **adapted to be submerged in the liquid feedstock**, said copper holders **adapted to fill** ~~filling up~~ internal volumes of said hollow cylinders, and said electrodes having parallel axial orientations at a mutual distance suitable to generate the submerged electric arc in their exterior cylindrical surfaces, and

further comprising:

means for axially rotating both electrodes; and

means for radially moving at least one of said at least one pair of electrodes toward and away from the other electrode.

17. (Currently Amended) The apparatus according to Claim 1,

wherein said at least one pair of electrodes comprises ~~submerged~~ rings of essentially the same widths **and adapted to be submerged in the liquid feedstock**, said rings being housed in copper holders with an axial part protruding for consumption, said copper holders being placed with parallel axes superimposed in such a way to create a gap in between their radial surfaces suitable for the generation of the ~~submerged~~ electric arc, and

further comprising:

means for rotating both rings; and

means for axially moving at least one ring toward and away from the other ring.

18. (Currently Amended) The apparatus according to Claim 1,

wherein said holders of the at least one pair of electrodes **are adapted to penetrate** ~~penetrates~~ a lid of said pressure resistant vessel, said lid having means for its rapid removal to facilitate the rapid servicing of the at least one pair of electrodes.

19. (Currently Amended) The apparatus according to Claim 1, further comprising:

means for circulating a portion of the produced **gas** ~~magnegas~~ exiting the pressurized vessel back into said vessel and substantially through said ~~submerged~~ electric arc.

20. (Currently Amended) The apparatus according to Claim 1, further comprising:

means for circulating said liquid feedstock substantially through said ~~submerged~~ electric arc.

21. (Currently Amended) The apparatus according to Claim 1, further comprising:

means for circulating a liquid additive rich in a substance missing in the liquid feedstock substantially through said ~~submerged~~ electric arc.

22. (Original) The apparatus according to Claim 21,

wherein said liquid feedstock is carbon-deficient, and

wherein said liquid additive is carbon-rich.

23. (Original) The apparatus according to Claim 21,

wherein said liquid feedstock is oxygen-deficient, and said liquid additive is oxygen-rich.

24. (Original) The apparatus according to Claim 21,
wherein said liquid feedstock is hydrogen-deficient, and
wherein said liquid additive is hydrogen-rich.

25. (Original) The apparatus according to Claim 22,
wherein said carbon-rich liquid additive is an oil.

26. (Original) The apparatus according to Claim 23,
wherein said oxygen-rich liquid additive is water.

27. (Original) The apparatus according to Claim 24,
wherein said hydrogen-rich liquid additive includes a substance selected from the group consisting of hydrohalogens.

28. (Original) The apparatus according to Claim 21, further comprising:
means for automatically refilling the liquid additive for facilitating uninterrupted long operation.

29. (Currently Amended) Apparatus for processing a liquid feedstock into a clean burning **combustible gas** ~~**magnegas**~~ via ~~**a submerged**~~ **an** electric arc **adapted to be submerged in a liquid feedstock** between at least one pair of electrodes with long life, minimal power losses and multiple flows substantially through said submerged electric arc, comprising:

a pressure resistant vessel;

the pressure resistant vessel ~~**being**~~ **adapted to be** essentially filled with a liquid feedstock;

at least one pair of electrodes having copper holders extending into copper rods extending from inside the pressure resistant vessel to outside said pressure resistant vessel;

said at least one pair of electrodes having ~~**a geometry which minimizes a distance between an electric arc between the electrodes and said copper holders**~~ **means** for minimizing **a** power loss in the delivery of ~~**the**~~ **a** current to ~~**said**~~ **an** electric arc **between the electrodes**, said electrodes having remaining dimensions essentially unrestricted for maximizing their life;

means for delivering ~~a~~ **said** current to said at least one pair of electrodes at least sufficient to create said ~~submerged~~ electric arc;

motion means for acting on said copper rods for initiating, maintaining and optimizing said ~~submerged~~ electric arc;

means for collecting the **clean burning combustible gas** ~~magnegas~~ produced by the ~~submerged~~ electric arc;

means for flowing substantially through said electric arc one of a flow of said produced **clean burning combustible gas** ~~magnegas~~, a flow of said liquid feedstock, a flow of a liquid additive rich in a substance missing in the liquid feedstock for the production of **the clean burning combustible gas** ~~magnegas~~ with a desired feature, and any combination thereof;

means for automatically refilling the liquid feedstock and said liquid additive for facilitating uninterrupted long operation; and

heat exchanger means for utilizing a heat produced by a thermochemical reaction caused by said ~~submerged~~ electric arc for maintaining a constant temperature.

30. (Currently Amended) A method for processing a liquid feedstock into a clean burning **combustible gas** ~~magnegas~~ via ~~a submerged~~ **an** electric arc **adapted to be submerged in a liquid feedstock** between at least one pair of electrodes with long life, minimal power losses and multiple flows substantially through said submerged electric arc, comprising:

providing a pressure resistant vessel;

the pressure resistant vessel ~~being~~ **adapted to be** essentially filled with a liquid feedstock;

providing at least one pair of electrodes having copper holders extending into copper rods extending from inside the pressure resistant vessel to outside said pressure resistant vessel;

said at least one pair of electrodes having ~~a geometry which minimizes a distance between an electric arc between the electrodes and said copper holders~~ **means** for minimizing **a** power loss in the delivery of ~~the~~ **a** current to ~~said~~ **an** electric arc **between the electrodes**, said electrodes having remaining dimensions essentially unrestricted for maximizing their life;

providing means for delivering a current to said at least one pair of electrodes at least sufficient to create said ~~submerged~~ electric arc;

providing motion means for acting on said copper rods for initiating, maintaining and optimizing said ~~submerged~~ electric arc;

providing means for collecting the **clean burning combustible gas** ~~magnegas~~ produced by the submerged electric arc;

providing means for automatically refilling the liquid feedstock for facilitating uninterrupted long operation; and

providing heat exchanger means for utilizing a heat produced by a thermochemical reaction caused by said ~~submerged~~ electric arc for maintaining a constant temperature.

31. (Original) The method according to claim 28, wherein said liquid feedstock is crude oil.

32. (Original) The method according to claim 30, wherein said liquid feedstock is an oil-base waste.

33. (Original) The method according to claim 30, wherein said liquid feedstock is fresh water.

34. (Original) The method according to claim 30, wherein said liquid feedstock is a water-base waste.

35. (Original) The method according to claim 30, wherein said liquid feedstock is seawater.

36. (Currently Amended) The method according to claim 30, wherein the current of said ~~submerged~~ electric arc is continuous.

37. (Currently Amended) The method according to claim 30, wherein the current of said ~~submerged~~ electric arc is alternating.

38. (Original) The method according to claim 30, wherein said electrodes are composed of graphite.

39. (Original) The method according to claim 30, wherein said electrodes are composed of coal.

40. (Currently Amended) The method according to claim 30, wherein one of the at least one pair of electrodes is **adapted to be** negatively charged and is composed of tungsten.

41. (Currently Amended) The method according to claim 30,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cylinder **which is adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cylinder, and

wherein another of the at least one pair of electrodes is **adapted to be** negatively charged and comprises ~~a submerged~~ **an** elongated parallelepiped of length essentially equal to a length of said positively charged electrode **and adapted to be submerged in the liquid feedstock**, a minimal width and a minimal height to achieve the same life as that of the positively charged electrode, said negatively charged electrode being housed in a copper holder with a width protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of the positively charged electrode, said negatively charged electrode being placed parallel to said positively charged electrode at a mutual distance ~~suitable~~ to generate ~~a~~ **said** ~~submerged~~ electric arc, and

further comprising:

providing means for axially rotating said positively charged electrode; and

providing means for radially moving the negatively charged electrode toward and away from said positively charged electrode.

42. (Currently Amended) The method according to claim 30,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises a ~~submerged~~ ring **adapted to be submerged in the liquid feedstock and** housed within a copper holder with an axial portion protruding for consumption, and

wherein another of the at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **adapted to be submerged in the liquid feedstock and** having essentially a diameter equal to a width of said ring and a minimal length to achieve the same life as that of the positively charged electrode, said negatively charged electrode being housed in a copper holder with an axial portions protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of the positively charged electrode and

having an axial alignment essentially perpendicular to a radial surface of said ring ~~so as~~ to create a gap ~~suitable~~ for the generation of the ~~submerged~~ electric arc, and

further comprising:

providing means for axially rotating said ring-shaped electrode; and

providing means for axially moving said rod shaped electrode toward and away from the other electrode.

43. (Currently Amended) The method according to claim 30,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cone **which is adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cone, and

wherein another of said at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **adapted to be submerged in the liquid feedstock** offset at an angle from an axis of said positively charged electrode ~~so as~~ to form a gap ~~suitable~~ for the generation of the ~~submerged~~ electric arc, said negatively charged electrode being house in a copper holder with an axial part protruding for consumption, and said copper holder of the negatively charged electrode being placed at a minimal distance from the copper holder of said positively charged electrode, and

further comprising:

providing means for axially rotating said positively charged electrode; and

providing means for axially moving said negatively charged electrode toward and away from the conical electrode.

44. (Currently Amended) The method according to claim 30,

wherein one of the at least one pair of electrodes is **adapted to be** positively charged and comprises ~~a submerged,~~ **an** elongated and hollow cylinder **which is adapted to be submerged in the liquid feedstock**, said copper holder **adapted to fill** ~~filling up~~ an internal volume of said hollow cylinder, and

wherein another of said at least one pair of electrodes is **adapted to be** negatively charged and comprises a ~~submerged~~ rod **which is adapted to be submerged in the liquid feedstock and** having a minimal diameter and length to achieve the same life as that of the

positively charged electrode, said negatively charged electrode being housed in a copper holder with an axial length protruding for consumption, said copper holder being placed at a minimal distance from the copper holder of said positively charged electrode, and said positively and negatively charged electrodes having perpendicular axial orientations at a mutual distance ~~suitable~~ for the generation of the ~~submerged~~ electric arc, and

further comprising:

providing means for rotationally, upwardly and downwardly moving said positively charged electrode in such a way to maintain the electric arc with said negatively charged electrode; and

providing means for axially moving said negatively charged electrode toward and away said positively charged electrode.

45. (Currently Amended) The method according to claim 30,

wherein said at least one pair of electrodes comprises ~~submerged,~~ elongated and hollow cylinders of essentially equal lengths **and adapted to be submerged in the liquid feedstock**, said copper holders **adapted to fill** ~~filling up~~ internal volumes of said hollow cylinders, and said electrodes having parallel axial orientations at a mutual distance ~~suitable~~ to generate the ~~submerged~~ electric arc in their exterior cylindrical surfaces, and

further comprising:

providing means for axially rotating both electrodes; and

providing means for radially moving at least one of said at least one pair of electrodes toward and away from the other electrode.

46. (Currently Amended) The method according to claim 30,

wherein said at least one pair of electrodes comprises ~~submerged~~ rings of essentially the same widths **which are adapted to be submerged in the liquid feedstock**, said rings being housed in copper holders with an axial part protruding for consumption, said copper holders being placed with parallel axes superimposed in such a way to create a gap in between their radial surfaces ~~suitable~~ for the generation of the ~~submerged~~ electric arc, and

further comprising:

providing means for rotating both rings; and

providing means for axially moving at least one ring toward and away from the other ring.

47. (Original) The method according to claim 30,

wherein said holders of the at least one pair of electrodes penetrates a lid of said pressure resistant vessel, said lid having means for its rapid removal to facilitate the rapid servicing of the at least one pair of electrodes.

48. (Currently Amended) The method according to claim 30, further comprising:

providing means for circulating a portion of the produced magnegas exiting the pressurized vessel back into said vessel and substantially through said ~~submerged~~ electric arc.

49. (Currently Amended) The method according to claim 30, further comprising:

providing means for circulating said liquid feedstock substantially through said ~~submerged~~ electric arc.

50. (Currently Amended) The method according to claim 30, further comprising:

providing means for circulating a liquid additive substantially through said ~~submerged~~ electric arc.

51. (Original) The method according to claim 50,

wherein said liquid feedstock is carbon-deficient, and

wherein said liquid additive is carbon-rich.

52. (Original) The method according to claim 50,

wherein said liquid feedstock is oxygen-deficient, and said liquid additive is oxygen-rich.

53. (Original) The method according to claim 50,

wherein said liquid feedstock is hydrogen-deficient, and

wherein said liquid additive is hydrogen-rich.

54. (Original) The method according to claim 51,

wherein said carbon-rich liquid additive is an oil.

55. (Original) The method according to claim 52,

wherein said oxygen-rich liquid additive is water.

56. (Original) The method according to claim 53,

wherein said hydrogen-rich liquid additive includes a substance selected from the group consisting of hydrohalogens.

57. (Original) The method according to claim 30,

wherein power is supplied to the electrodes during its operation at a power of at least 200 Kwh.

58. (Original) The method according to claim 30,

wherein power is supplied to the electrodes during its operation at a power of at least 50 Kwh.

59. (Original) The method according to claim 50, further comprising:

providing means for automatically refilling the liquid additive for facilitating uninterrupted long operation.

60. (Currently Amended) A method for processing a liquid feedstock into a clean burning ~~magnegas~~ **combustible gas** via ~~a submerged~~ **an** electric arc **adapted to be submerged in a liquid feedstock** between at least one pair of electrodes with long life, minimal power losses and multiple flows substantially through said ~~submerged~~ electric arc, comprising:

providing a pressure resistant vessel;

the pressure resistant vessel ~~being~~ **adapted to be** essentially filled with a liquid feedstock;

providing at least one pair of electrodes having copper holders extending into copper rods extending from inside the pressure resistant vessel to outside said pressure resistant vessel;

said at least one pair of electrodes having ~~a geometry which minimizes a distance between an electric arc between the electrodes and said copper holders~~ for minimizing **a** power loss in the delivery of ~~the~~ **a** current to said electric arc **between the electrodes**, said electrodes having remaining dimensions essentially unrestricted for maximizing their life;

providing means for delivering a current to said at least one pair of electrodes at least sufficient to create said ~~submerged~~ electric arc;

providing motion means for acting on said copper rods for initiating, maintaining and optimizing said ~~submerged~~ electric arc;

providing means for collecting the **clean burning combustible gas** ~~magnegas~~ produced by the ~~submerged~~ electric arc;

providing means for flowing substantially through said electric arc one of a flow of said produced **clean burning combustible gas** ~~magnegas~~, a flow of said liquid feedstock, a flow of a liquid additive rich in a substance missing in the liquid feedstock for the production of **the clean burning combustible gas** ~~magnegas~~ with a desired feature, and any combination thereof;

providing means for automatically refilling the liquid feedstock and said liquid additive for facilitating uninterrupted long operation; and

providing heat exchanger means for utilizing a heat produced by a thermochemical reaction caused by said ~~submerged~~ electric arc for maintaining a constant temperature.